REMARKS

The specification stands objected to, generally, for failing to have the title properly presented and for failing to have proper heading sections. Pages 1, 3, 10, 11, and the abstract have been amended to overcome this objection.

The specification, pages 16, 18, and 19, further stands objected to for failing to provide support for the numerals shown in the drawings and for failing to discuss all of the circuit connections shown in Figure 12. The specification has been amended to overcome this objection. No new matter has been added. Copies of the amended and clean pages are attached hereto with identification in the upper margin.

The drawings stand objected to for failing to include the numeral "8" in Figure 1 and numeral 15 in Figure 10 to be consistent with the discussion in the specification. The drawings have been amended to add these numerals. The drawings also stand objected to for showing the numeral "36" in Figure 11 and the numeral "46" in Figure 12 without corresponding discussion in the specification. These numerals "36" and "46" have been removed from the drawings. A marked-up copy of the drawings is attached. A substitute set of formal drawings is also attached. The standing 37 CFR 1.84(p)(5) objection has now been overcome.

Claim 12 stands objected to under 35 USC 112 for insufficient antecedent basis for "the four pixel elements". This objection has been overcome pursuant to the Examiner's remarks by amending the dependency of claim 12 from 9 to 11.

Claim 18 stands objected to under 35 USC 112 for lack of antecedence for the limitation "each PMD-pixel". The Examiner has suggested changing the dependency of claim 18 from 16 to 17. This amendment has been provided, herein. Moreover, the "PMD-pixel" limitation has now been added by amendment to claim 16 and a new parallel claim 24 has been added to depend from further amended claim 16.

Claim 21 has been objected to under 35 USC 112 for lack of antecedence for the limitation "the pixels". The dependency of this claim has been changed to claim 8, per the Examiner's suggestion. This objection has now been overcome.

Claims 2, 5, 6, 8-18, 22 and 23 stand objected to as being dependent from a rejected base claim. The Examiner has remarked that these claims would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims.

Claim 2 has been amended herein to include all of the limitations of claim 1. It is believed that now amended claim 2 is now allowable.

Claim 3 has been amended to depend from claim 2 and should therefore be allowable. Claims 4-23 have been amended to depend from claim 2 and/ or an intervening dependent claim. The now amended claims 4-23 should therefore also be allowable. New claim 24 depends from claim 16 and should also be allowable.

Claim 1 stands rejected under 35 USC 103(a) as obvious in view of Schwarte (WO 98/10255) when read with Lambeth (US 4,826,312). The Schwarte reference has been provided by the Examiner with only its abstract translated into English. Rudolf Schwarte (WO 98/10255) is the applicant in this application.

Applicant's attorneys have obtained what is believed to be an English translation of the entirety of the WO/98/10255 reference by obtaining a copy of the corresponding Australia patent 715284. A copy is attached hereto as Exhibit "A".

The Examiner has relied upon the WIPO reference for two photosensitive modulation photogates and two shaded accumulation gates ('10255, Fig. 6) connected to a read-out device, and a modulating device to increase/ decrease the potential of the modulation photogates with the accumulation gates being read-out diodes.

The Examiner has relied upon Lambeth to show long narrow parallel strips and the length 10 times more than the wavelength of the electromagnetic radiation.

This rejection is respectfully TRAVERSED. Claim 1 has been amended herein to make it clear that the accumulation gates (4,5) are neither photosensitive nor shaded. This claim 1 recited that limitation as filed, however, it is believed this amendment makes the limitation read more clearly.

The Schwarte WIPO reference as remarked by the Examiner, in fact requires that his accumulation gates are "shaded"

Further, claim 1 as originally filed, and as now amended, recites a limitation that the accumulation gates are read-out diodes with the cathode thereof as the read-out electrode. The WIPO reference does not obviate this feature, nor the non-shaded feature recited in amended claim 1.

Lambeth shows an elongate photodiode 22 connected between a first transfer gate 26 and a second transfer gate 32. The first transfer gate 26 is connected to a charge coupled device shift register 24 output device, while the second transfer gate 32 is connected to a drain 30 (ground). Lambeth teaches that his photodiode 22 have a size and shape of the light beam cross-section produced by his source LED 10. Since the Lambeth LED produces a light beam have a cross-section of 100 μm x 1000 μm, his photodiode is to have that same size. Because commercial diodes of this size have high capacitance which Lambeth does not want, he teaches his custom made diode 22 which has a long narrow stripe, surrounded by an optically active region covered with a thick field oxide which is transparent to infrared light. The optically active region overlays a lightly doped channel stop. (col. 3, lines 37-41). Lambeth shows a cross-section of this diode in Figure 2 (col 3, lines 41-48). His diode has a region of "n+ type" impurity 42 in a "p type" silicon substrate. The optically active regions between the stripes are conventional channel stopping regions of "p+ type" impurities 46 covered by a thick field oxide 48.

Lambeth explains his design (col 3, lines 49-55):

"By shaping the diode in this way, i.e, a marrow stripe adjacent an optically active region covered by thick field oxide, the area of the optically active region is large, but the area and hence the capacitance of the photodiode is considerably reduced compared to a conventional photodiode having the same optically active area."

This is inapposite to what is described, shown in the drawings and claimed by applicant. Applicant's photosensitive gates 1,2 are characterized as being long and narrow. But these are comparative terms and have to be placed in perspective. Applicants accumulation gates (4,5) are the same length, but much narrower.

Moreover, applicant's claim 1 requires that his read-out diodes have their cathodes connected as the read-out electrodes. The cathode is the negatively charged electrode. Lambeth's does not address this limitation.

For these reasons it is believed that the amended claim 1 now presented for examination differentiates over the cited art and is not rendered obvious by the prior art of record. It is urged that the case is now ready for issue.

Respectfully submitted,
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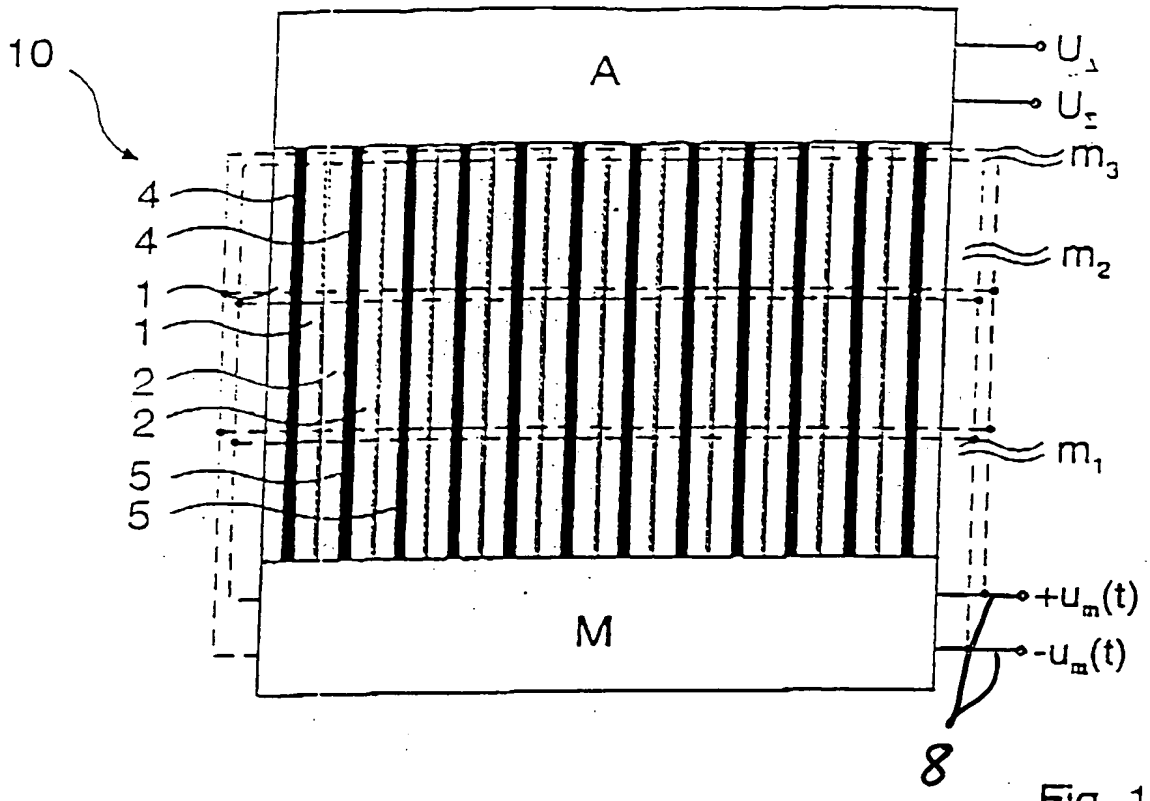

Fig. 1

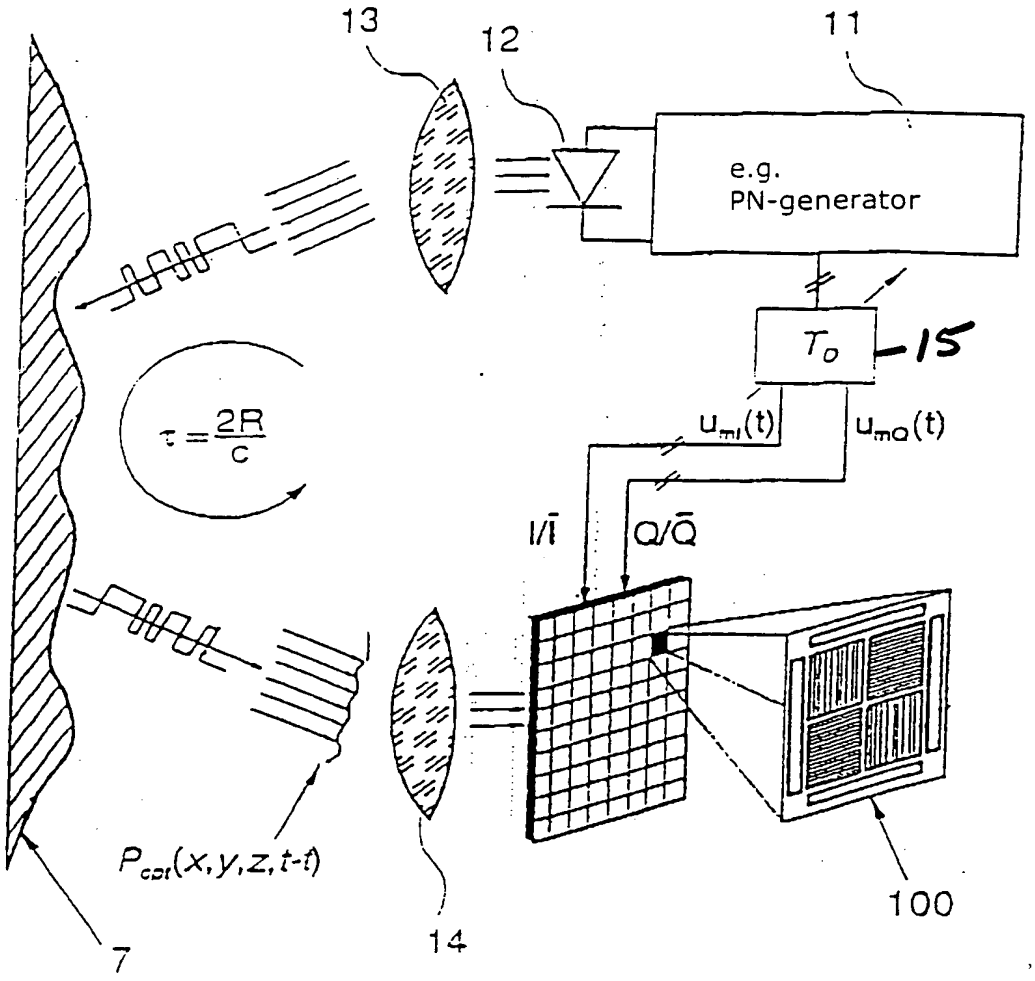

Fig. 10

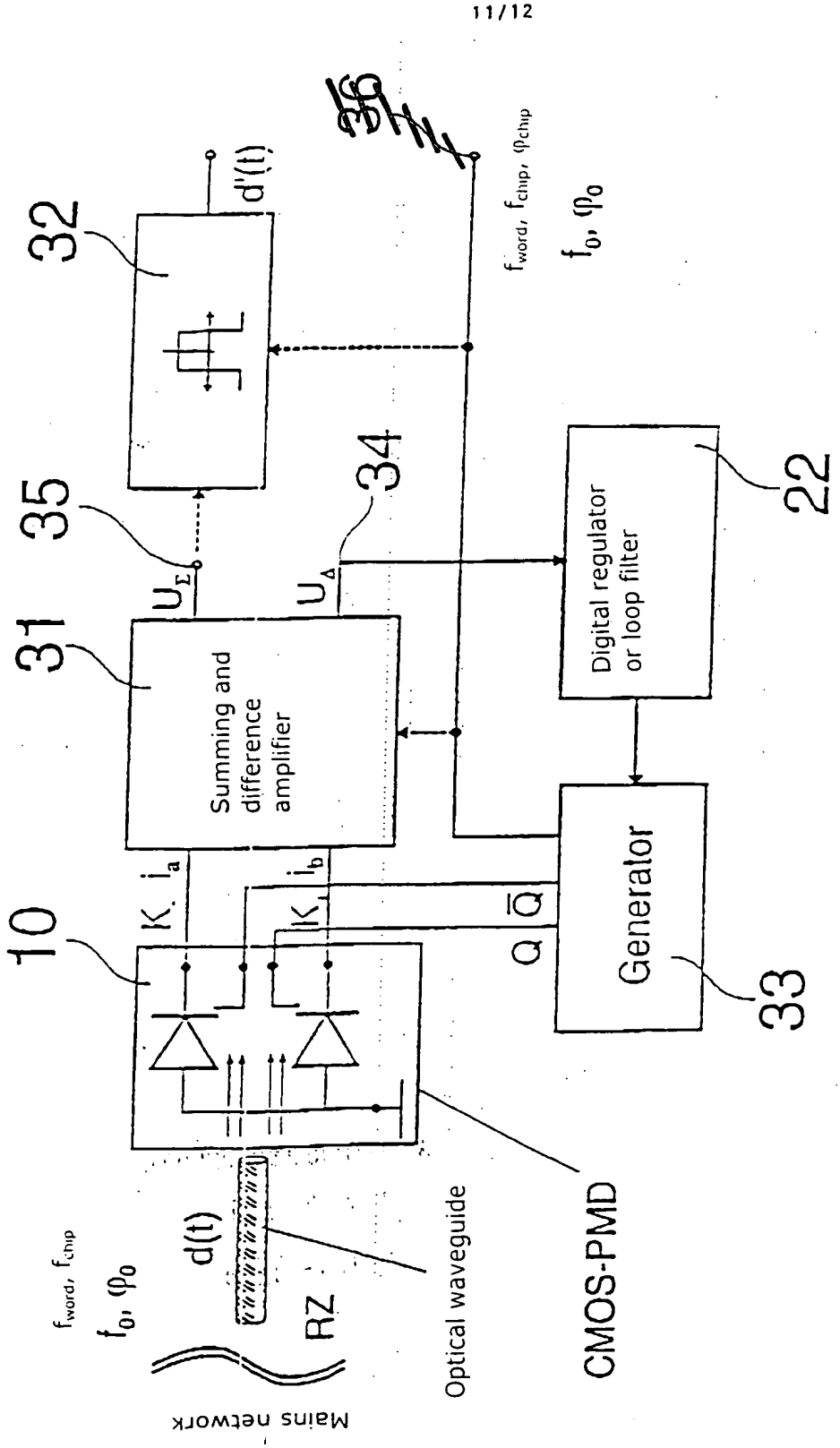

Fig. 11

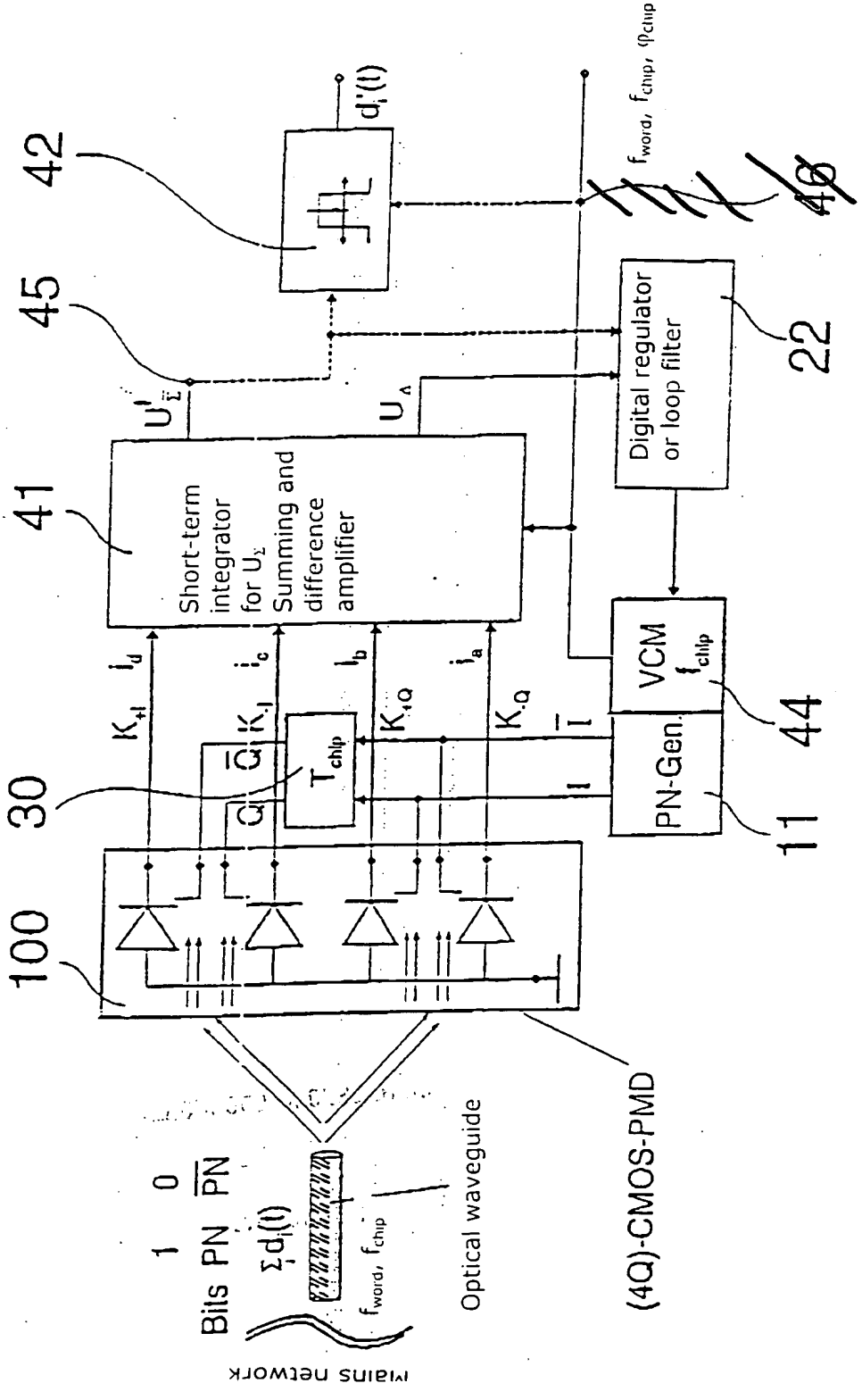

Fig. 12